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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,503	10/15/2003	Hitoshi Sakamoto	243863US3DIV	4590

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EXAMINER	
BUEKER, RICHARD R	
ART UNIT	**PAPER NUMBER**
1763	

DATE MAILED: 09/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory Action Before the Filing of an Appeal Brief	Application No. 10/684,503	Applicant(s) SAKAMOTO ET AL.	
	Examiner Richard Bueker	Art Unit 1763	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 24 August 2006 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☐ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: _____.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuaton Sheet.
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08 or PTO-1449) Paper No(s). _____
13. ☒ Other: See attached Notice of References Cited (PTO-892).

Richard Bueker
Primary Examiner
Art Unit: 1763

Continuation of 11. Applicants have argued that "there is no motivation to combine Brors and Foster with Claverie". The motivation is provided by Brors at col. 8, lines 29-37, where he teaches that there is a minimum temperature at which CVD process gases having low volatility will condense on the walls of the chamber. Brors makes clear that condensation of gases on the chamber wall is undesirable, and that heating the chamber walls above the condensation temperature of the CVD process gases will prevent condensation. Bror's teaching is generic to all process gases regardless of how the process gas was manufactured.

It is noted also that Claverie (see abstract for example) specifically describes his reactor as a CVD reaction chamber. Also, Claverie's CVD chamber is a "cold wall" CVD chamber, according to the definition of a cold wall CVD chamber provided by Foster (col. 9, lines 21-27). Therefore, the apparatus of Claverie, Brors and Foster are all of the same type of CVD apparatus. From Brors and Foster, it would have been obvious to provide a condensation preventing heater in any cold wall type CVD chamber which was intended to be used with a process gas that condenses at room temperature or above.

Claverie's CVD chamber is intended to be used with copper chlorides (see col. 5, line 1 of Claverie) as the CVD process gas. It is a thermodynamic fact that copper chlorides are low volatility compounds that condene at ambient temperatures. See for example Fig. 1 of the article by Bourhila (Microelectronic Engineering) which was cited by applicants' in their IDS filed Oct. 15, 2003; Fig. 1 of Chen (US Pub. No. 2004/0112863); page 40, col. 1, lines 22-32 of the article by Lee (Thin Solid films) which

was cited of interest in the Final rejection; and pages D-182 and D-183 of the Handbook of Chemistry and Physics, which provides vapor pressure data as a function of temperature for cuprous chloride. Bourhila, Chen, Lee and the Handbook all show the fact that copper chloride compounds are inherently low volatility compounds that are solids at room temperature. Chen and the Handbook are cited of interest on the attached Form PTO-892. Regarding Chen, it is noted that a reference having a later publication date can properly be relied on for showing an inherent fact.

Since Claverie suggests the use of the inherently low volatility copper chloride as a CVD process gas, and Brors teaches that a condensable CVD process gas requires a heated CVD chamber wall, it would have been obvious to one skilled in the art to provide a heater for the walls of Claverie's CVD reactor.

It is noted also that Claverie teaches at col. 4, lines 31-34 that his apparatus is not limited to use only with copper chloride. He intends his coating apparatus to be versatile enough to be used for depositing thin films of a variety of different metals other than copper. In view of this teaching, it would have been obvious to use Claverie's apparatus with a CVD process gas such as WF_6, in accordance with the teachings of Inoue (see page 2, lines 18-28 of the translation), to deposit tungsten thin films, for example. It is noted that WF_6 is a CVD process gas used by Brors (see col. 10, lines 13-16) and Foster (col. 20, lines 44-47). For these reasons also, the teaching of Brors and Foster with respect to chamber wall temperature control means are applicable to (and combinable with) the apparatus of Claverie.

It is noted also that applicants' specification at page 33, lines 14-24, and page 68, lines 6-11, for example, teaches that the purpose of applicants' chamber wall heating means is to prevent condensation of the CVD process gas on the inner walls of applicants' CVD coating chamber, which is the same purpose as taught by Brors.

Applicants have also argued that Claverie does not require heating the substrate to a deposition temperature. This argument is not in accordance with the teachings of Claverie, who teaches (see col. 3, lines 29-33 and col. 4, lines 44-45 and 59-61, for example) that his substrate is heated to 250° to 300° C during the copper deposition process by the heater 15 illustrated in Fig. 1.

Further regarding applicants' claim 20 recitaton of "chamber heating means for heating an inner wall of the chamber to a predetermined temperature", it is noted that Claverie's vacuum coating chamber contains a substrate holder and substrate to be coated that are heated to 250° to 300° C, a hot tungsten filament heated to 800° to 2000° C (see col. 3, lines 34-37), a hot copper metal source which is heated to 1000° C, and the hot precursor gases which are heated by their passage through the 1000° C copper source. Each of these hot elements would inherently heat an inner wall of the coating chamber of Claverie by thermal radiation or conduction, at least to some extent. While Claverie did not include a discussion of these aspects of his reactor, they all *inhernetly* constitute "chamber heating means for heating an inner wall of the chamber to a predetermined temperature" as recited in claim 20.

The Condensed Chemical dictionary is cited of interest. It indicates that CuCl and Cu_2Cl_2 are both known as cuprous chloride.